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**Bottle with special top for use
in the medical field**

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D e s c r i p t i o n

The invention relates to a bottle with a special top for use in the medical field.

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If a patient is suffering from a loss of functioning of his upper digestive organs (oral cavity, pharyngeal cavity, oesophagus), he can no longer chew and swallow, but his gastro-intestinal functioning is usually still in order. So, from a medical viewpoint, such a patient has to be fed artificially by introduction of nutrient solutions and liquids into his stomach or intestines. This is called enteral feeding. Either through the nasal cavity or directly through the abdominal wall, a thin-walled feeding tube system is introduced directly

into the patient's stomach, or if there is no stomach functioning, directly into intestines, to provide a route for food. In addition, a transfer system is necessary to run liquid from a container into the feeding tube. On hy-
5 gienic grounds, such a transfer system is not used for more than 24 hours.

In this process, various containers are used in which the liquid food is kept and from which it is fed to the patient through the tube.

10 Such a container may be, for example, a plastic bag filled with liquid food which is hung on an infusion stand and connected to a stomach feeding tube. These bags are usually elasticated bags made of plastic which contract when emptied because of the vacuum that is created.
15 They are prefilled disposable products designed to be thrown away after being used once. They are used exclusively for administration of a liquid nutrient solution.

Another alternative are plastic containers filled at the hospital with various liquids, such as
20 herbal tea, and to which, in a second step, the transfer system to the stomach feeding tube is then connected. These containers have the drawback that the necessary hygienic precautions are not always taken when they are filled in the hospital. For example, these containers are
25 hung on infusion stands, a cap located on the top is opened and the liquid, which is frequently a herbal tea made at the hospital itself, is poured in. Due to the height of suspension, the liquid is frequently spilt and thus both the container and the stand splashed. Another
30 drawback is that these containers are used repeatedly

without being properly and hygienically cleaned between uses.

In addition, such containers have the disadvantage that they involve a considerable amount of work for hospital staff. The standard procedure is to boil tap water first. This is then used to make the herbal tea - another step in the process. The containers also need to be cleaned, the boiled liquid has to cool before - as the last step - it can be poured into the container and fed to the patient.

Against this background, it is the mission of the present invention to create a bottle with a special top for use in the medical field which does not have the drawbacks listed above and represents an easy-to-handle hygienically safe container for use for artificial feeding. In addition, the aim is for the work involved for hospital staff to be significantly reduced by use of the bottle which constitutes the subject of the invention.

This is achieved by a bottle with a special top as per Claim 1.

The bottle with a special top for use in the medical field has a top with a coupling for a transfer system to a feeding tube and it has a freshness seal. Another advantage is that there is a pressure-relief opening in the top. So this is a standard bottle, made of PET for example, tailored to the special needs for use for enteral feeding. For example, it can be filled with mineral water in the normal way and delivered to hospitals. Use in hospitals is very easy. Nursing staff need only to take a prefilled bottle and fit a feeding tube to the

coupling in the top of the bottle. This action pierces the freshness seal. A continuous flow of liquid from the bottle is ensured by a pressure-relief opening in the top.

5 On the one hand, this system enables utilisation of low-cost standard beverage bottles instead of the special containers used at present. What is more, mineral water companies can then supply liquids for enteral nutrition of patients, which means that patients would be
10 provided with minerals in a way not possible with the use of boiled tap water as customary today. In addition, it is a system involving little work, since all that has to be done is to hang the bottle on an infusion stand and connect the feeding tube. The top provides a coupling for
15 the transfer system and so no longer needs to be fastened to a container separately. Finally, the system is hygienically safe, since the bottles are prefilled and have a freshness seal.

 This hygienic benefit is given further weight
20 by a version of the invention with a top that is not detachable from the bottle. A suitable form of construction for this purpose consists of a top with an internal thread that is screwed into an external thread on the neck of the bottle, with the top having a lock-in ring on
25 its lower edge so that it is not detachable. Thus the top can only be removed from the neck of the bottle by force and will be damaged in the process.

 A different form of construction has perforation lines that tear apart when the top is unscrewed,
30 thus guaranteeing that the bottle really is only used

once. This meets the high hygienic standards essential in hospitals.

To fasten the feeding tube to the top of the bottle, the coupling to which the transfer system to the feeding tube is fitted has an external thread and the feeding tube has on its free end a cap with an internal thread which can be screwed into the external thread. In addition, there is a tubular cannula on the free end of the feeding tube to pierce the freshness seal. The cannula is inserted into the coupling in the top and pierces the seal in the process. Then the cap with the internal thread is screwed into the coupling with the external thread and the feeding tube fixed firmly onto the bottle top in this way.

Appropriately, a semi-permeable membrane is fitted into the pressure-relief opening, designed to enable pressure relief without permitting liquid to escape through the pressure-relief opening. Preferably, a felt membrane with the above qualities should be fitted in the pressure-relief opening.

An example of how the invention could be constructed is described in more detail below with the help of drawings. They show

Fig. 1 a side view of top 1 with attached feeding tube 3;

Fig. 2 a top view of the top 1.

The top 1 constituting the subject of the invention has on its upper side a coupling 2 with an exter-

nal thread 6. In addition, there is a pressure-relief opening 5 on the upper side, in which a semi-permeable membrane has been fitted.

5 On the coupling 2, a feeding tube 3 is fastened by means of a cap 7. For this purpose, the cap 7 has an internal thread 9 which engages in the external thread 6. When the cap 7 is screwed in place, a cannula 11 at the free end 8 of the feeding tube 3 is put into the coupling
10 and pierces the freshness seal 4. The freshness seal 4 is fitted to the inside of the top 1.

 On the lower edge of the top 1, there is a lock-in ring 14 which prevents the top from being un-
15 screwed.

 The construction form of the invention as described here is a structurally simple solution of the problems described above. The result is an easy-to-handle and hygienically safe beverage bottle which can be used
20 for enteral feeding of patients in hospital.